IN THE CLAIMS:

1. (Original) A Computer Aided Design apparatus for aiding a design of a printed wiring board, comprising:

determining means for determining a component order in an ascending order of impedance of passive components amongst components to be placed on the printed wiring board; and

placement means for placing the passive components in the determined component order.

2. (Original) A Computer Aided Design apparatus according to Claim 1, wherein

the placement means places each of the passive components in a vicinity of a power pin of a non-passive component which is already placed.

3. (Original) A Computer Aided Design apparatus according to Claim 2, wherein

the determining means determines the component order using an ascending order of equivalent series inductance of the passive components as the ascending order of impedance.

4. (Original) A Computer Aided Design apparatus according to Claim 3, wherein the determining means comprises:

table means for retaining a plurality of pin spacings of passive components and an inductance value corresponding to each pin spacing,

referring means for referring to the equivalent series inductance corresponding to the pin spacing of each passive component retained in the table means; and

sorting means for sorting the inductance value referred for each passive component in ascending order, and making the ascending order of inductance value the component order.

5. (Original) A Computer Aided Design apparatus according to Claim 4, wherein the determining means determines the component order using a descending order of effective frequency spectrum as the ascending order of impedance, the effective frequency spectrum being a frequency spectrum in which the impedance of a passive component is no greater than a threshold value.

6. (Original) A Computer Aided Design apparatus according to Claim 5, wherein the determining means comprises:

table means for retaining a plurality of pin spacings of passive components, and an effective frequency spectrum corresponding to each pin spacing,

referring means for referring each the effective frequency spectrum corresponding to the pin spacing of each passive component retained in the table means; and

sorting means for sorting the effective frequency spectrum referred for each component in descending order, and making the descending order of effective frequency spectrum the component order.

7. (Original) A Computer Aided Design apparatus according to Claim 5, wherein the determining means comprises:

calculation means for calculating the effective frequency spectrum for each passive component from at least one of a capacitance and an inductance of the passive component; and

sorting means for sorting the effective frequency spectrum calculated for each component in descending order, and making the descending order of effective frequency spectrum the component order.

8. (Original) A Computer Aided Design apparatus according to Claim 7 wherein the calculation means calculates the effective frequency spectrum using at least the inductance of a passive component, when the passive component is one of a capacitor, a resistor, and a filter.

9. (Original) A Computer Aided Design apparatus according to Claim 2, wherein the passive components are capacitors; and
the determining means determines the component order using an ascending order of the equivalent series inductance of the capacitors as the ascending order of impedance.

10. (Original) A Computer Aided Design apparatus according to Claim 9, wherein the determining means determines the component order using an ascending order of capacity of the capacitors as the ascending order of equivalent series inductance.

11. (Original) A Computer Aided Design apparatus according to Claim 9, wherein the determining means determines the component order considering an ascending order of terminal spacing of the capacitors to be the ascending order of equivalent series inductance.

12. (Original) A Computer Aided Design apparatus according to Claim 9, wherein the determining means comprises:

table means for retaining a plurality of pin spacings of capacitors, and an equivalent series inductance corresponding to each pin spacing,

referring means for referring to each the effective frequency spectrum corresponding to the pin spacing of each capacitor retained in the table means; and

sorting means for sorting the equivalent series inductance referred for each component in descending order, and making the sorted equivalent series inductances the component order.

13. (Original) A Computer Aided Design apparatus according to Claim 2, wherein the passive components are capacitors; and

the determining means determines the component order using a descending order of effective frequency spectrum, the effective frequency spectrum being a frequency spectrum in which the impedance of a capacitor is no greater than a threshold value, instead of the ascending order of impedance.

14. (Original) A Computer Aided Design apparatus according to Claim 13, wherein the determining means comprises:

table means for retaining a plurality of pin spacings of capacitors, and an effective frequency spectrum corresponding to each pin spacing,

referring means for referring to the effective frequency spectrum corresponding to the pin spacing of each capacitor retained in the table means; and

sorting means for sorting the effective frequency spectrum referred for each capacitor in descending order, and making the sorted effective frequency spectrum the component order.

15. (Original) A Computer Aided Design apparatus according to Claim 13 wherein the determining means comprises:

calculation means for calculating the effective frequency spectrum for each capacitor from at least one of a capacitance and an inductance of the capacitor; and

sorting means for sorting and the effective frequency spectrum calculated for capacitor in descending order, and making the sorted effective frequency spectrum the component order.

16. (Original) A Computer Aided Design apparatus according to Claim 1, further comprising:

pin order determining means for setting a pin order for each power pin of non-passive components in order of seriousness of noise that can occur in a current that flows through the power pin; and

assigning means for assigning each passive component to a component which has a power pin, in descending pin order and descending component order,

the placement means placing each passive component in a vicinity of the power pin of the component to which the passive component is assigned, in the descending order of component order.

17. (Original) A Computer Aided Design apparatus according to Claim 16, wherein the pin order determining means determines the pin order using a descending order of a signal frequency which is driven by a current which flows through the power pin, as the order of seriousness.

18. (Original) A Computer Aided Design apparatus according to Claim 16, wherein the pin order determining means determines the pin order using an order of shortness of one of a rising time and a falling time of a signal which is driven by a current which flows through the power pin, instead of the order of seriousness.

19. (Original) A Computer Aided Design apparatus according to Claim 16, wherein the pin order determining means determines the pin order using an ascending order of shortness of the shorter of a rising time and a falling time of a signal which is driven by a current which flows through the power pin, as the order of seriousness.

20. (Original) A Computer Aided Design apparatus according to Claim 16 wherein the pin order determining means determines the pin order using a descending order of an amount of consumed current of a signal which is driven by a current which flows through the power pin, as the order of seriousness.

21. (Original) A Computer Aided Design apparatus according to Claim 16, wherein the pin order determining means calculates a voltage waveform of a signal which is driven by the current which flows through the power pin, based on a voltage, a frequency, a rising time, a falling time, and a duty ratio of the signal and sets the pin order using a descending

order of a maximum frequency of a voltage that exceeds a voltage threshold in the voltage waveform, as the order of seriousness.

22. (Original) A Computer Aided Design apparatus according to Claim 16, wherein

the pin order setting means determines the pin priority order of power pins connected to a net, for each net, and

the assigning means assigns components to be connected to a net to one net.

23. (Original) A Computer Aided Design apparatus for a printed wiring board for placing a component belonging to a second type of components in a vicinity of a component belonging to a first type of components, comprising:

first determining means for determining a pin order in order of seriousness of noise that can occur in a current that flows through a power pin, for a power pin of each of the components belonging to the first type of components,

second determining means for determining a component order in ascending order of impedance for each component belonging to the second type of components; and

assigning means for assigning a second type component which is highest amongst the components in the component order that are not assigned, to a first type component having a power pin which is highest amongst the power pins in the pin priority that are not assigned.

24. (Original) A Computer Aided Design apparatus according to Claim 23, wherein

the first type of components includes active components, and the second type of components is passive components.

25. (Original) A Computer Aided Design apparatus according to Claim 23, further comprising:

placement means for placing each second type component in a vicinity of a first type component having the power pin to which the second type component is assigned, in the component order.

26. (Original) A Computer Aided Design apparatus according to Claim 25, wherein the first determining means determines the pin order using a descending order of a signal frequency which is driven by a current which flows through the power pin, as the order of seriousness.

27. (Original) A Computer Aided Design apparatus according to Claim 26 wherein the second determining means determines the component order using an ascending order of equivalent series inductance of the passive components as the ascending order of impedance.

28. (Original) A Computer Aided Design apparatus according to Claim 27, wherein the first determining means comprises:

table means for retaining a plurality of pin spacings of passive components and an inductance value corresponding to each pin spacing,

referring means for referring to the effective frequency spectrum corresponding to the pin spacing of each passive component retained in the table means, and

sorting means for sorting the inductance value referred for each passive component in ascending order, and making the ascending order of inductance value the component order.

29. (Original) A Computer Aided Design apparatus according to Claim 26, wherein the second determining means determines the component order using a descending order of effective frequency spectrum as the ascending order of impedance, the effective frequency spectrum being a frequency spectrum in which the impedance of a passive componet is no greater than a threshold value.

30. (Original) A Computer Aided Design apparatus according to Claim 26, wherein the second determining means comprises:

table means for retaining a plurality of pin spacings of passive components, and an effective frequency spectrum corresponding to each pin spacing,

referring means for referring to the equivalent series inductance corresponding to the pin spacing of each passive component retained in the table means; and

sorting means for sorting the effective frequency spectrum referred for each component in descending order, and making the descending order of effective frequency spectrum the component order.

31. (Original) A Computer Aided Design apparatus according to Claim 29, wherein the second determining means comprises:

calculation means for calculating the effective frequency spectrum for each passive component from at least one of a capacitance and an inductance of the passive component; and

sorting means for sorting the effective frequency spectrum calculated for each component in descending order, and making the descending order of effective frequency spectrum the component order.

32. (Original) A Computer Aided Design apparatus according to Claim 26, wherein the passive components are capacitors, and

the second determining means determines the component order using an ascending order of the equivalent series inductance of the capacitors as the ascending order of impedance.

33. (Original) A Computer Aided Design apparatus according to Claim 32, wherein the second determining means determines the component order using an ascending order of capacity of the capacitors as the ascending order of equivalent series inductance.

34. (Original) A Computer Aided design apparatus according to Claim 32, wherein the second determining means determines the component order considering an ascending order of terminal spacing of the capacitors to be the ascending order of equivalent series inductance.

35. (Original) A Computer Aided Design apparatus according to Claim 32, wherein the second determining means comprises:

table means for retaining a plurality of pin spacings of capacitors, and an equivalent series inductance corresponding to each pin spacing,

referring means for referring to the equivalent series inductance corresponding to the pin spacing of each capacitor retained in the table means; and

sorting means for sorting the equivalent series inductance referred for each component in descending order, and making the sorted equivalent series inductances the component order.

36. (Original) A Computer Aided Design apparatus according to Claim 26, wherein the passive components are capacitors, and

the determining means determines the component order using a descending order of effective frequency spectrum, the effective frequency spectrum being a frequency spectrum in which the impedance of a capacitor is no greater than a threshold value, instead of the ascending order of impedance.

37. (Original) A Computer Aided Design apparatus according to Claim 36, wherein the second determining means comprises:

table means for retaining a plurality of pin spacings of capacitors, and an effective frequency spectrum corresponding to each pin spacing,

referring means for referring to the effective frequency spectrum corresponding to the pin spacing of each capacitor retained in the table means; and

sorting means for sorting the effective frequency spectrum referred for each capacitor in descending order, and making the sorted effective frequency spectrum the component order.

38. (Original) A Computer Aided Design apparatus according to Claim 36, wherein the second determining means comprises:

calculation means for calculating the effective frequency spectrum for each capacitor from at least one of a capacitance and an inductance of the capacitor; and

sorting means for sorting and the effective frequency spectrum calculated for capacitor in descending order, and making the sorted effective frequency spectrum the component order.

39. (Original) A Computer Aided Design apparatus according to Claim 25, wherein the pin order determining means determines the pin order using an order of shortness of one of a rising time and a falling time of a signal which is driven by a current which flows through the power pin, instead of the order of seriousness.

40. (Original) A Computer Aided Design apparatus according to Claim 39, wherein the second determining means determines the component order using an ascending order of equivalent series inductance of the passive components as the ascending order of impedance.

41. (Original) A Computer Aided Design apparatus according to Claim 39, wherein the second determining means determines the component order using a descending order of effective frequency spectrum as the ascending order of impedance, the effective frequency spectrum being a frequency spectrum in which the impedance of a passive component is no greater than a threshold value.

42. (Original) A Computer Aided Design apparatus according to Claim 39, wherein the passive components are capacitors, and

the second determining means determines the component order using an ascending order of the equivalent series inductance of the capacitors as the ascending order of impedance.

43. (Original) A Computer Aided Design apparatus according to Claim 39, wherein the passive components are capacitors, and

the second determining means determines the component order using a descending order of effective frequency spectrum, the effective frequency spectrum being a frequency spectrum in which the impedance of a capacitor is no greater than a threshold value, instead of the ascending order of impedance.

44. (Original) A Computer Aided Design apparatus according to Claim 25, wherein

the first determining means determines the pin order using an order of shortness of one of a rising time and a falling time of a signal which is driven by a current which flows through the power pin, instead of the order of seriousness.

45. (Original) A Computer Aided Design apparatus according to Claim 44, wherein

the second determining means determines the component order using an ascending order of equivalent series inductance of the passive components as the ascending order of impedance.

46. (Original) A Computer Aided Design apparatus according to Claim 44, wherein

the second determining means determines the component order using a descending order of effective frequency spectrum as the ascending order of impedance, the effective frequency spectrum being a frequency spectrum in which the impedance of a passive component is no greater than a threshold value.

47. (Original) A Computer Aided Design apparatus according to Claim 44, wherein

the passive components are capacitors, and

the determining means determines the component order using an ascending order of the equivalent series inductance of the capacitors as the ascending order of impedance.

48. (Original) A Computer Aided Design apparatus according to Claim 44, wherein the passive components are capacitors, and

the second determining means determines the component order using a descending order of effective frequency spectrum, the effective frequency spectrum being a frequency spectrum in which the impedance of a capacitor is no greater than a threshold value, instead of the ascending order of impedance.

49. (Original) A Computer Aided Design apparatus according to Claim 25, wherein the first determining means determines the pin order using a descending order of an amount of consumed current of a signal which is driven by a current which flows through the power pin, as the order of seriousness.

50. (Original) A Computer Aided Design apparatus according to Claim 49, wherein the second determining means determines the component order using an ascending order of equivalent series inductance of the passive components as the ascending order of impedance.

51. (Original) A Computer Aided Design apparatus according to Claim 49, wherein the second determining means determines the component order using a descending order of effective frequency spectrum as the ascending order of impedance, the effective frequency spectrum being a frequency spectrum in which the impedance of a passive component is no greater than a threshold value.

52. (Original) A Computer Aided Design apparatus according to Claim 49, wherein the passive components are capacitors, and

the second determining means determines the component order using an ascending order of the equivalent series inductance of the capacitors as the ascending order of impedance.

53. (Original) A Computer Aided Design apparatus according to Claim 44, wherein the passive components are capacitors, and

the second determining means determines the component order using a descending order of effective frequency spectrum, the effective frequency spectrum being a frequency spectrum in which the impedance of a capacitor is no greater than a threshold value, instead of the ascending order of impedance.

54. (Original) A Computer Aided Design apparatus according to Claim 25, wherein the first determining means calculates a voltage waveform of a signal which is driven by the current which flows through the power pin, based on a voltage, a frequency, a rising time, a falling time, and a duty ratio of the signal and sets the pin order using a descending order of a maximum frequency of a voltage that exceeds a voltage threshold in the voltage waveform, as the order of seriousness.

55. (Original) A Computer Aided Design apparatus according to Claim 54, wherein the second determining means determines the component order using an ascending order of equivalent series inductance of the passive components as the ascending order of impedance.

56. (Original) A Computer Aided Design apparatus according to Claim 54, wherein

the second determining means determines the component order using a descending order of effective frequency spectrum as the ascending order of impedance, the effective frequency spectrum being a frequency spectrum in which the impedance of a passive component is no greater than a threshold value.

57. (Original) A Computer Aided Design apparatus according to Claim 54, wherein

the passive components are capacitors, and

the second determining means determines the component order using an ascending order of the equivalent series inductance of the capacitors as the ascending order of impedance.

58. (Original) A Computer Aided Design apparatus according to Claim 54, wherein

the passive components are capacitors, and

the second determining means determines the component order using a descending order of effective frequency spectrum, the effective frequency spectrum being a frequency spectrum in which the impedance of a capacitor is no greater than a threshold value, instead of the ascending order of impedance.

59. (Previously Presented) A Computer Aided Design apparatus according to Claim 25, further comprising:

storage means for storing sets of net information, each set of net information showing a net made up of a plurality of pins to be connected,

dividing means for dividing, based on one set of net information, a net whose power pins are to be connected into section nets, each section net corresponding to a component

group made up of one first type component and at least one second type component assigned thereto,

selection means for selecting, for each section net, a power pin of a component whose impedance is highest, from amongst the second type components connected to the section net, as a representative pin; and

wiring means for wiring each section net independently, and for wiring so that a plurality of the representative pins are connected.

60-86. (Cancelled)

87. (Original) A computer program embodied on a computer readable medium for use with a computer for aiding a design of a printed wiring board, the program realizing on the computer:

determining means for determining a component order in an ascending order of impedance of passive components amongst components to be placed on the printed wiring board; and

placement means for placing the passive components in the determined component order.

88. (Original) A computer program according to Claim 87, wherein

the placement means places each of the passive components in a vicinity of a power pin of a non-passive component which is already placed.

89. (Original) A computer program according to Claim 87, wherein the program further realizes on the computer:

pin order determining means for setting a pin order for each power pin of non-passive components in order of seriousness of noise that can occur in a current that flows through the power pin; and

assigning means for assigning each passive component to a component which has a power pin, in descending pin order and descending component order,

the placement means placing each passive component in a vicinity of the power pin of the component to which the passive component is assigned, in the descending order of component order.

90. (Original) A computer program embodied on a computer readable medium for use with a computer for aiding a design of a printed wiring board for placing a component belonging to a second type of components in a vicinity of a component belonging to a first type of component, on the printed wiring board, the program realizing on the computer:

first determining means for determining a pin order in order of seriousness of noise that can occur in a current that flows through a power pin, for a power pin of each of the components belonging to the first type of components,

second determining means for determining a component order in ascending order of impedance for each component belonging to the second type of components; and

assigning means for assigning a second type component which is highest amongst the components in the component order that are not assigned, to a first type component having a power pin which is highest amongst the power pins in the pin priority that are not assigned.

91. (Original) A component placement evaluation aiding computer program embodied on a computer readable medium for displaying a placement of components that are on a wiring board and aiding an evaluation by a user of whether a placement of a position dependent component whose effectiveness differs according to a placement position is appropriate, the program realizing on a computer:

a position information storage step for storing a set of position information which is made up of information showing a position on a wiring board of

(a) a position dependent component, or a pin thereof, and

(b) one or more effected components, or pins thereof, which are potentially effected by the position dependent component,

a retrieval step for retrieving from the position dependent component or the pin thereof, based on the sets of position information stored in the position information storage step, for each effected component or the pins thereof, whether the effected component or the pin thereof is within a predetermined distance from the placement dependent component or the pin thereof, or for retrieving a predetermined number of effected components or pins thereof in a predetermined order; and

a relationship information storage step for storing the effected component or the pin of the effected component retrieved in the retrieval step in relation with the position dependent component or the pin thereof from which the retrieval was performed, as relationship information.

92. (Original) A component placement evaluation aiding computer program embodied on a computer readable medium for aiding an evaluation by a user of whether a

placement of a position dependent component whose effectiveness differs according to a placement position is appropriate, the program realizing on a computer:

a position information storage step for storing a set of position information which is made up of information showing a position on a wiring board of

(a) a position dependent component, or a pin thereof, and

(b) one or more effected components, or pins thereof, which are potentially effected by the position dependent component,

a retrieval step for retrieving from the position dependent component or the pin thereof, based on the sets of position information stored in the position information storage step, for each effected component or the pins thereof, whether the effected component or the pin thereof is within a predetermined distance from the placement dependent component or the pin thereof, or for retrieving a predetermined number of effected components or pins thereof in a predetermined order; and

a relationship information storage step for storing the effected component or the pin of the effected component retrieved in the retrieval step in relation with the position dependent component or the pin thereof from which the retrieval was performed, as relationship information.

93. (Original) A component placement evaluation aiding computer program embodied on a computer readable medium for aiding an evaluation by a user of whether a placement of a position dependent component whose effectiveness differs according to a placement position is appropriate, the program realizing on a computer:

a position information storage step for storing a set of position information which is made up of information showing a position on a wiring board of

(a) a position dependent component, or a pin thereof, and

(b) one or more effected components, or pins thereof, which are potentially effected by the position dependent component,

a retrieval step for retrieving from the effected component or the pin thereof, based on the sets of position information stored in the position information storage step, for each position dependent component or the pins thereof, whether the position dependent component or the pin thereof is within a predetermined distance from the effected component or the pin thereof, or for retrieving a predetermined number of position dependent components or pins thereof in a predetermined order; and

a relationship information storage step for storing the position dependent component or the pin of the position dependent component retrieved in the retrieval step in relation with the effected component or the pin thereof from which the retrieval was performed, as relationship information.

94. (Original) A program implemented on a computer for aiding a design of a printed wiring board, the program realizing on the computer:

determining means for determining a component order in an ascending order of impedance of passive components amongst components to be placed on the printed wiring board; and

placement means for placing the passive components in the determined component order.

95. (Original) A program according to Claim 94, wherein

the placement means places each of the passive components in a vicinity of a power pin of a non-passive component which is already placed.

96. (Original) A program according to Claim 94, further realizing on a computer:

pin order determining means for setting a pin order for each power pin of non-passive components in order of seriousness of noise that can occur in a current that flows through the power pin; and

assigning means for assigning each passive component to a component which has a power pin, in descending pin order and descending component order,

the placement means placing each passive component in a vicinity of the power pin of the component to which the passive component is assigned, in the descending order of component order.

97. (Original) A program implemented on a computer for aiding a design of a printed wiring board for placing a component belonging to a second type of components in a vicinity of a component belonging to a first type of component, on the printed wiring board, the program realizing on the computer:

first determining means for determining a pin order in order of seriousness of noise that can occur in a current that flows through a power pin, for a power pin of each of the components belonging to the first type of components,

second determining means for determining a component order in ascending order of impedance for each component belonging to the second type of components; and

assigning means for assigning a second type component which is highest amongst the components in the component order that are not assigned, to a first type component having a power pin which is highest amongst the power pins in the pin priority that are not assigned.

98. (Cancelled)

99. (Original) A program implemented on a computer for aiding an evaluation by a user of whether a placement of a position dependent component whose effectiveness differs according to a placement position is appropriate, the program realizing on a computer:

a position information storage step for storing a set of position information which is made up of information showing a position on a wiring board of

(a) a position dependent component, or a pin thereof, and

(b) one or more effected components, or pins thereof, which are potentially effected by the position dependent component,

a retrieval step for retrieving from the position dependent component or the pin thereof, based on the sets of position information stored in the position information storage step, for each effected component or the pins thereof, whether the effected component or the pin thereof is within a predetermined distance from the placement dependent component or the pin thereof, or for retrieving a predetermined number of effected components or pins thereof in a predetermined order; and

a relationship information storage step for storing the effected component or the pin of the effected component retrieved in the retrieval step in relation with the position dependent component or the pin thereof from which the retrieval was performed, as relationship information.

100. (Original) A program implemented on a computer for aiding an evaluation by a user of whether a placement of a position dependent component whose effectiveness differs according to a placement position is appropriate, the program realizing on a computer:

a position information storage step for storing a set of position information which is made up of information showing a position on a wiring board of

(a) a position dependent component, or a pin thereof, and

(b) one or more effected components, or pins thereof, which are potentially effected by the position dependent component,

a retrieval step for retrieving from the effected component or the pin thereof, based on the sets of position information stored in the position information storage step, for each position dependent component or the pins thereof, whether the position dependent component or the pin thereof is within a predetermined distance from the effected component or the pin thereof, or for retrieving a predetermined number of position dependent components or pins thereof in a predetermined order; and

a relationship information storage step for storing the position dependent component or the pin of the position dependent component retrieved in the retrieval step in relation with the effected component or the pin thereof from which the retrieval was performed, as relationship information.

101. (New) The component placement evaluation aiding computer program of Claim 91 wherein the position information storage step includes storing a priority order for noise generating components.

102. (New) The component placement evaluation aiding computer program of Claim 91 wherein the position information storage step includes identifying components that are noise-countering components.

103. (New) The component placement evaluation aiding computer program of Claim 91 wherein the position information storage step includes determining effective components based on an effective frequency spectrum according to pin spacing.

104. (New) The component placement evaluation aiding computer program of Claim 91 wherein the position information storage step includes determining a pin priority order.

105. (New) The component placement evaluation aiding computer program of Claim 91 wherein the position information step includes determining component priority order in ascending order of impedance.